APPLICATION OF ERTS-A DATA TO AGRICULTURAL PRACTICES IN THE MISSISSIPPI DELTA REGION

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16. Abstract

Reports the current status of Contract NAS5-21817. To date ground truth has been collected for the test areas. The August 3, 1973 ERTS pass over the Mississippi Delta Site was heavily cloud covered and does not appear to be useful. We have not received any data since that pass.

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PREFACE

The objective of this contract is a study of the application of ERTS-A data on (1) agronomy-crops, (2) grasslands, and (3) forestry. Ground based data which is pertinent to each of these areas will be collected and reduced to computerized form by a data management team. The data management team will have the responsibility of developing data analyses for comparison of the ground based data with the ERTS-A data after spectral signature and other analyses have been performed on the ERTS-A data by NASA-MTF-ERL.

This project is organized with three phases: I. Data Management; II. Ground Truth; III. Application of ERTS Data to Potential Users.

The scope of this reporting period encompasses the first two phases.

Ground truth measurements have been made during this reporting period.

Fields to be used as test plots have been identified.

The format for the ground truth data forms has been developed and distributed and a procedure for transferring the data to computer cards has been determined and is in effect.

As yet MSU investigators have not received data from the MTF-ERL facility.

INTRODUCTION

This report covers the period from April 1973 through October 1973 and describes the progress of the project during the period.

The ground truth data has been taken and the appropriate equipment is in the fields.

A set of fields for the test plots has been selected. Fields being used as test plots include cotton, corn, rice, soybean, grass pasture, fallowed, various timbers, and weed infestations if such fields have in fact been planted and exist. These fields will be located near the Delta Branch Experiment Station, Stoneville, Mississippi. Adjacent commercial farms will also be monitored. A format for computerizing the ground truth data file has been developed and the ground truth data forms will be printed so as to facilitate the key punching of the data onto computer cards.

During this reporting period, several meetings of all project personnel have been called so that the project objectives could be reviewed and a plan of the work effort be made.

PROJECT ORGANIZATIONS AND STATUS

The personnel involved in the project and their area of responsibility are listed below.

Dr. C. C. Baskin, Responsible for contacting the potential users of the ERTS data. Agronomy is the main area.

Dr. C. W. Bouchillon, Principal Investigator of the contract.

Mr. R. W. Boyd, Responsible for data logging and initial analysis of the ERTS data.

Dr. F. M. Ingels, Responsible for coordination of effort and data management.

Mr. J. S. Therrell, Responsible for contacting the potential users of the ERTS data. Forestry is the main area.

Dr. G. Tupper, Responsible for the ground truth data.

Phase I, Data Management, has been involved with the initial analysis of the ERTS-1 MSS data in photographic form and in the development of a suitable data form with which the ground truth data will be recorded and computerized. There have been no significant changes in the processing of the data. The MSU researchers receive all data from ERTS-1 (on 9.5+ positive transparencies) which covers the Mississippi Delta Area and has 30% or less cloud cover. These frames are plotted on a Mississippi map and from this, coverage of our defined test area

is determined. Cloud cover and quality of data are also assessed, and the results of this analysis is recorded on a Data Analysis Sheet.

Also, a catalog search has been conducted to determine all data which ERTS-1 has taken over the Delta Area. This has been done by means of published center point co-ordinates, and the average frame size and shape of data already received over the area. From this type analysis we intend to determine the frequency of data loss due to clouds, system anomalies, and any other reason. Examples of these analyses may be found in the previous type II report.

Since the Standard Catalogs have been arriving several months after the actual passes there is a considerable time delay in this analysis.

The collection of ground truth data, for Phase II, has started. A listing of fields selected and their crop is found in table I. Data from the fields is taken once every 18 days in conjunction with the satellite's passing. This will be stored on computer cards so that the statistics on a group of passes or a group of fields for the complete period can be quickly and easily calculated by the computer.

No computer generated data has been received to date from NASA-MTF-ERL. Therefore, analysis of pattern recognition capabilities has not begun. We do expect the first computer generated maps in the near future.

The August 3, 1973 data was to be processed by NASA-MTF-ERL for the MSU investigators, however the MSS film we received indicates a significant cloud cover. MSU personnel received the MSS film from the August 3, 1973 pass on September 17, 1973 and we have not received any data since then. It is our hope that the next pass will have been on a good day, since the August 3, 1973 data appears to be unuseable.

PROGRAM FOR THE NEXT REPORTING INTERVAL

After the initial computer generated products are available (around the end of January 1974) we shall be able to contact the potential users of this data and to begin the analysis of its accuracy and potential applications. Until then we are continuing the ground truth measurement phase.

CONCLUSIONS AND RECOMMENDATIONS

At this time it is too early to speculate on the anticipated results of the project.

It is apparent that the time log between the data reception and the original pass for that data will be a problem for applications such as we have in mind. One exception will be the study of timber and forest resources inventory. It appears that ERTS data will be exceptionally useful in this area.

TABLE I

Ground Truth Test Sites

Delta Branch Experiment Station Crop Test Sites

Site Number	Crop	Field Size (Acres)
1	Corn	75
2	Pasture	150
3	Cotton (2 x 2)	200
4	Cotton (2 x 1)	200
5	Forest	30
6	Rice	140
7	Soybeans (clean)	150
8	Soybeans (weed infested)	200

Delta Branch Experiment Station Area Forestry Test Sites

Site Number	Cooperator	Tree Type	Field Size (Acres)
1	Chicago Mill & Lumber Company	Cottonwood	100
2	Chicago Mill & Lumber Company	Cottonwood	800
3	Chicago Mill & Lumber Company	Sycamore	40
4	Chicago Mill & Lumber Company	Willow	500
5	Chicago Mill & Lumber Company	Elm, Pecan, Hackberry	150
6	Chicago Mill & Lumber Company	Pecan, Sycamore, Gum	500
7	Mississippi Forestry Commission	Mixed Pecans, Gums, Oaks	537
8	Crown Zellerback	Cottonwood	800
9	U. S. Forest Service	Green Ash Hackberry	40
10	U. S. Forest Service	Overcup Oak	40